

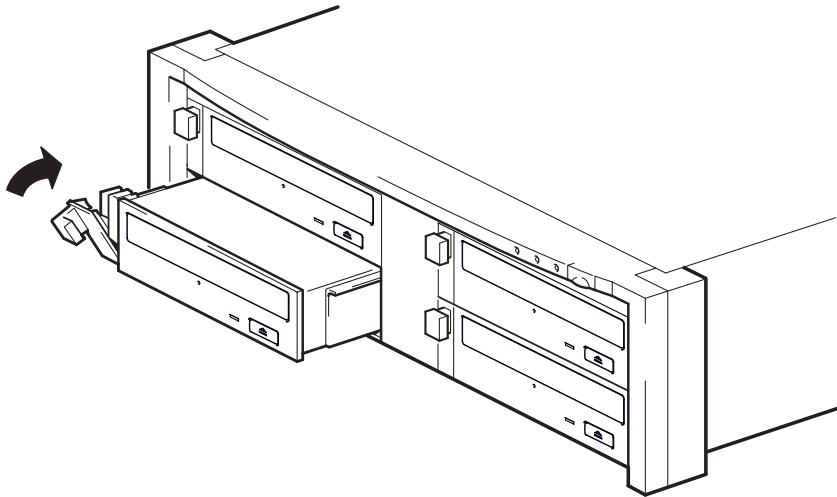
hp StorageWorks DVD+RW drive

getting started guide

removable model

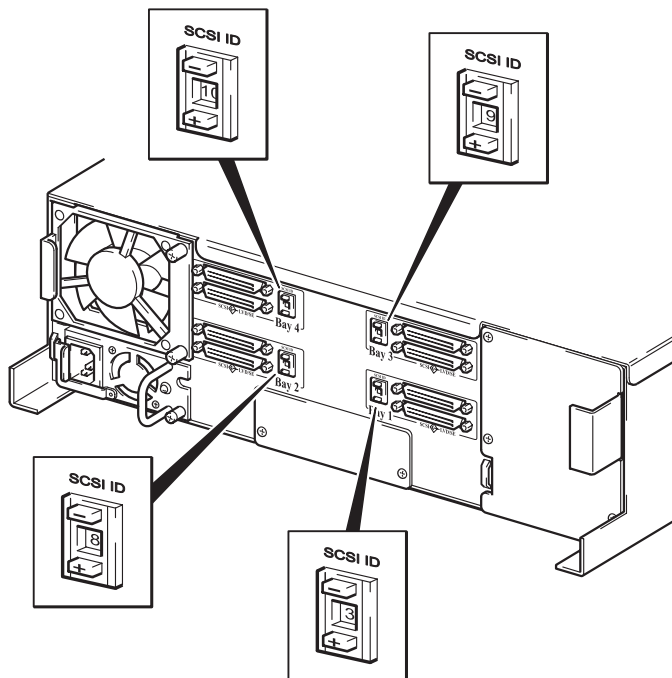


1



hp StorageWorks tape array 5300

2



hp StorageWorks tape array 5300

HP StorageWorks DVD+RW array modules - overview

HP StorageWorks DVD+RW drives are designed to be installed in a rack-mounted HP StorageWorks Tape Array 5300. Refer to the documentation supplied with your tape array for tape array installation instructions.

| | |
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| Step 1: Install the drive | page 7 |
| Ensure the drive extractor lever is in the <i>out</i> position. Slide the DVD+RW drive into an empty bay of the tape array. The DVD+RW drive needs to mate with the connectors at the back of the bay. Push the extractor lever in until it locks the drive in position. | |
| Step 2: Set the drive's SCSI ID | page 9 |
| SCSI IDs for drives in the tape array are set on the back panel of the array. We recommend that the drive is connected to a dedicated host bus adapter. Make sure that the SCSI bus is terminated. | |
| Your HP StorageWorks DVD+RW drive | page 11 |
| Operating the drive | page 13 |
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Product Details

Write your DVD+RW drive details here so you can find them easily if you need them.

| | |
|----------------------------------|--|
| Model (type of drive): | |
| Model (number): | |
| Serial (number): | |
| Date purchased/installed: | |
| SCSI ID: | |

Before you start

HP StorageWorks DVD+RW drives

HP StorageWorks DVD+RW drives are installed in an HP StorageWorks Tape Array 5300. They allow the user to back up data and to install software from CD or DVD disks if the server itself does not have a CD or DVD drive. HP StorageWorks DVD+RW drives may be used in conjunction with other HP StorageWorks rack-ready devices. For example, the tape array may contain:

- four DVD+RW drives, each connected to a separate server (as shown in the illustrations in this guide)
- or a mixture of DVD+RW drives and HP StorageWorks tape drives, such as the DAT or Ultrium drives

If devices are daisy-chained, HP StorageWorks DVD+RW drives should only be connected to the same SCSI bus as other LVD SCSI devices. For further details see "HP StorageWorks DVD+RW drives and SCSI" on page 4.

This guide describes how to install and operate the following HP StorageWorks DVD+RW models:

- Q1592A

Prerequisites

To install and use your new DVD+RW drive, you will need the following:

- HP StorageWorks Tape Array 5300 and appropriate SCSI cables
- SCSI host bus adapter on host server

For the latest list of operating systems that support HP StorageWorks DVD+RW drives, please consult our World Wide Web site (www.hp.com/go/connect).

HP tape arrays

You need a properly installed and configured HP Tape Array 5300, which is a rack-mounted system designed to hold removable drives. They can be installed in HP, IBM and other compatible 19" rackmount systems.

Airflow

The blanking panels provided with the tape array must be installed in empty slots. The HP StorageWorks Tape Array 5300 is designed to provide adequate airflow for up to four half-height HP StorageWorks rack-ready drives (or up to two full-height tape drives). If the tape array is not fully populated, use blanking plates in any unused bays. Ventilation must be adequate at the front and rear of the tape array.

SCSI cables and terminators

HP StorageWorks DVD+RW drives require no SCSI cables to plug into an HP StorageWorks Tape Array 5300. However, cabling and terminators are required to connect the tape array with the SCSI host.

Refer to your HP StorageWorks Tape Array 5300 *Getting Started Guide* for details of how to install SCSI cables and terminators to the SCSI connections on the rear panel of the tape

array. The latest version of this document can be downloaded from [//www.hp.com/support/tapearray](http://www.hp.com/support/tapearray).

You will need to order the correct length and SCSI connector type cables and terminators to suit your particular configuration. Cable and terminators options are listed at the HP tape array support web site: [//www.hp.com/support/tapearray](http://www.hp.com/support/tapearray), and can be ordered from your local HP sales office.

SCSI host bus adapter

Up to four host servers can be attached to the HP StorageWorks Tape Array 5300. Each server needs a properly installed and configured SCSI host adapter or a built-in SCSI controller on the computer's motherboard (SCSI-2 or SCSI-3 compliant). Connectivity information can be found on our World Wide Web site: [//www.hp.com/go/connect](http://www.hp.com/go/connect). Check the server documentation for the specification of any built-in SCSI channels. Do not connect to a RAID controller channel; these are for disk drives only.

HP StorageWorks DVD+RW drives and SCSI

All HP rack-ready devices connect to the rack enclosure through a blind-mate, easy-plug connector. The connectors on the back of the rack enclosure are all 68-pin. To connect a device in your rack enclosure with the host system, you need a 68-pin to 68-pin, LVDS-compliant cable that is compatible with the type of bus used by the host system. For device-to-device connection in the rack use a (68-pin to 68-pin) 0.5 meter cable.

If your drive is the only SCSI device or if it is the last SCSI device in a daisy-chain of devices, you must install a terminator.

Cable and terminator options are listed at the HP tape array support web site: [//www.hp.com/support/tapearray](http://www.hp.com/support/tapearray), and can be ordered from your local HP sales office.

Product specification

HP's rack-ready DVD+RWs have the following features and benefits:

- 5¼-inch, half-height array module for use with HP StorageWorks Tape Array 5300.
- DVD and CD read/write functionality in a racked environment.
- Enables data storage backup.
- High data transfer rate (see table below).
- Enables software loading in a racked environment.
- Supports offline swapping (drives may be swapped without powering down the tape array as long as there is no other activity on the bus).

| | |
|--|---|
| Physical dimensions | 42 mm (1.65 in.) H 165 mm (6.5 in.) W 320 mm (12.6 in.) D |
| Product Weight | 1.47 kg (3.25 lbs) |
| Packaged Weight | 3.1 kg (6.83 lbs) |
| Data interface | Ultra 2 SCSI, LVDS |
| Data transfer rate | CAV 8x as DVD+R, CAV 4x as DVD+RW, CAV 12x as DVD CAV 32x as CD-R, CAV 10x as CD-RW, CAV 40x as CD |
| Current and power consumption | |
| Sleep mode (average) | <= 2 W |
| Idle | <= 7 W |
| Nominal (Read/Write) | <= 14 W (depends on mode) |
| Average peak (40x + full stroke access) | <= 20 W |
| Power supply (input voltage) | Normal DC input voltage: +5V (+/- 5%), +12V (+/- 10%) |
| Mechanism | DVD+RW, offline hot swappable |
| Access time/seek time | 140 ms random average (DVD); 120 ms random average (CD) |
| Standards supported | DVD formats (up to 4.7 GB capacity): DVD-ROM (Read Only), DVD+R, DVD+RW, DVD-R (Read Only), DVD-RW (Read Only), DVD-Video (Read Only). CD formats (up to 700 MB capacity, based on 80 min media): CD-R, CD-RW, CD-DA, CD Extra, CD-ROM (Mode 1 - Yellow Book), CD-ROM XA & CD-I (Mode 2/Form 2 - Green Book), Photo-CD (single and multi-session), CD-Video, CD-Text. |
| Load mechanism | Tray |
| Loading time | Less than 5 seconds (the period the disk is started to load and clamped in the drive) |
| Unloading time | Less than 5 seconds (from eject button press to disk unload) |
| Warranty | 3 years |

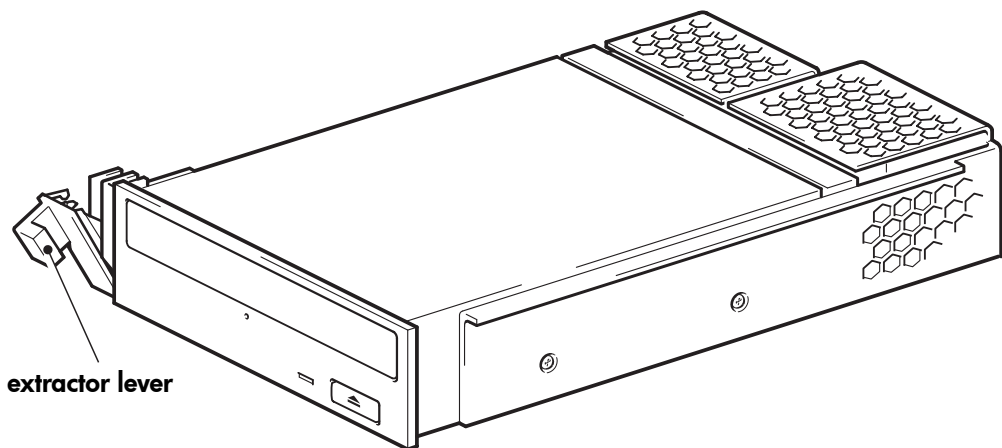


Figure 1a: extractor lever in the out position

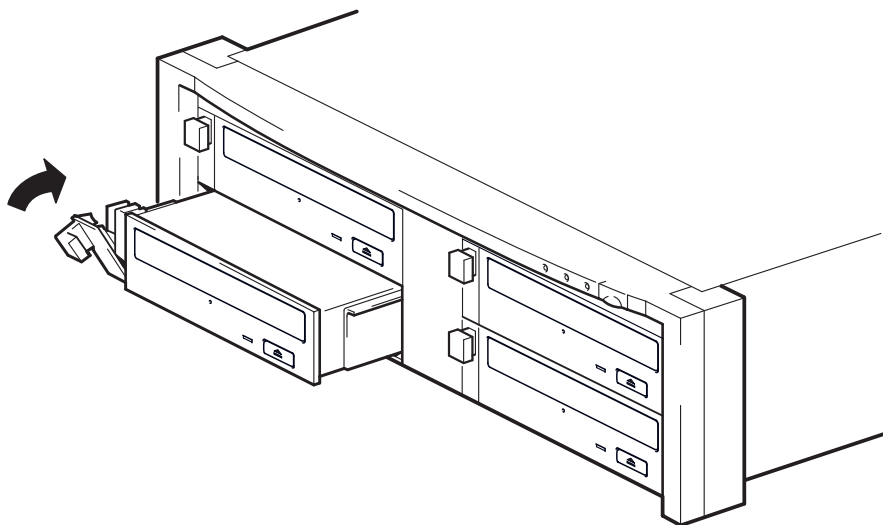


Figure 1b: installing the drive

Step 1: Install the drive

HP StorageWorks DVD+RW drives are designed to be installed in a rack-mounted HP StorageWorks Tape Array 5300, which may also contain other HP StorageWorks DVD+RW drives or tape backup devices. Refer to the documentation supplied with your tape array for tape array installation instructions.

- 1 Before installing a DVD+RW drive, make sure that the extractor lever is in the fully open position (pulled out) as shown on figure 1a.

Caution When handling a DVD+RW drive, hold the drive by the side carrier framework. To avoid possible damage, do not hold the body of the drive and do not push or pull on the drive's front panel.

- 2 Slide the drive into one of the open bays, as shown on figure 1b, ensuring that the guide rails on both sides of the drive locate into the slots on the partition wall. Carefully but firmly ensure the drive is pushed fully in so that the rear connectors are securely seated. The extractor level will close slightly.

Note Correct alignment of SCSI drives in the tape array is essential to ensure a secured connection is made between the interface of the drive and the interface of the array.

- 3 Push on the extractor lever to complete the insertion and to lock the drive in place.

Caution It is very important to ensure blanking plates are fitted if less than the full complement of drives is installed. Failure to do so may affect drive performance. If there are less than four half-height drives installed, insert a blanking plate into the empty bays. This is essential to ensure adequate airflow is maintained.

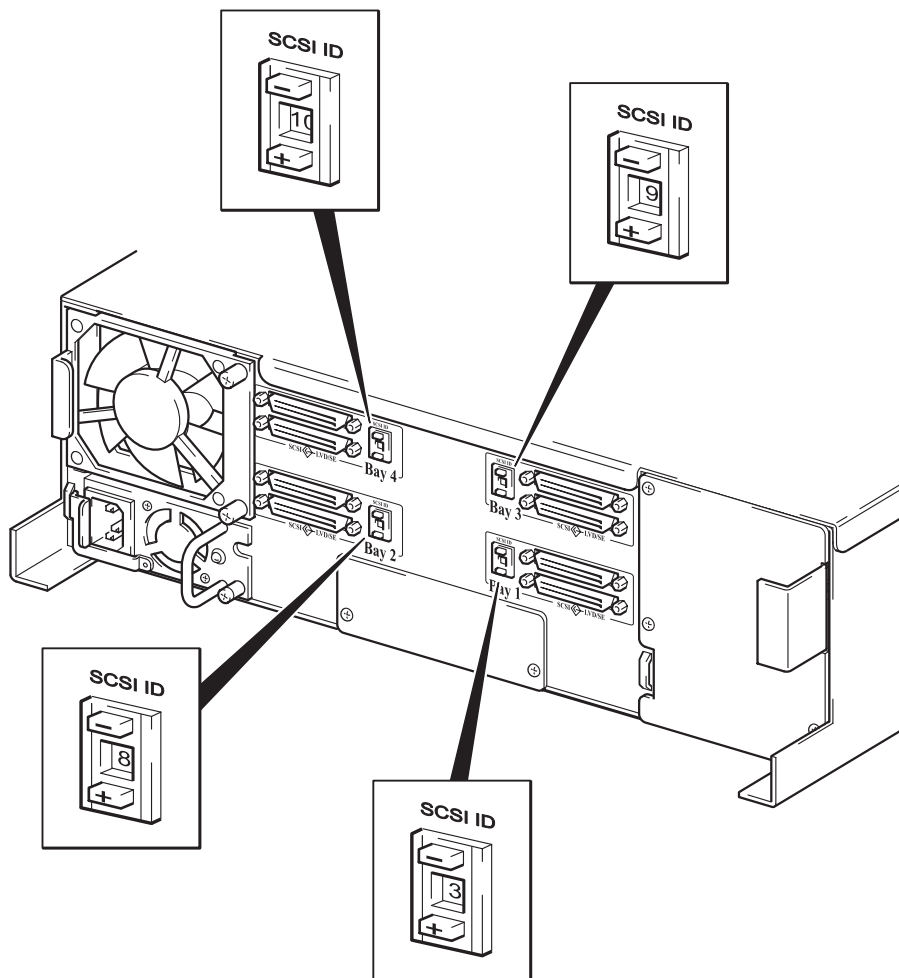


Figure 2: setting the SCSI ID

Step 2: Set the drive's SCSI ID

Note SCSI IDs for drives in the tape array are set on the back panel of the array. HP StorageWorks DVD+RW drives can be assigned any *unused* ID between 1 and 15. Do not use SCSI ID 7, which is reserved for the SCSI controller, or SCSI ID 0, which is typically assigned to the boot disk.

- 1 Decide which SCSI ID to use.
- 2 Set the appropriate switch, as shown in figure 2. If you daisy-chain devices, make sure that devices are of the same SCSI type and that each device on the same SCSI bus has a unique SCSI ID. Do not daisy-chain more than two devices on the same SCSI bus.

Note The HP StorageWorks Tape Array 5300 has four SCSI ID switches to enable the installation of up to four half-height drives.

- 3 Make sure that an appropriate SCSI terminator is attached to the spare SCSI connector on the back of the tape array. If you daisy-chain devices, make sure that the end device is terminated.

Note Write the model name, product number, serial number, and SCSI ID of your drive at the front of this guide for future reference. The product and serial numbers are on a label on the side of the drive.

SCSI cables and terminators

HP StorageWorks DVD+RW devices require no SCSI cables to plug into an HP StorageWorks Tape Array 5300. However, cabling and terminators are required to connect the tape array with the SCSI host.

Refer to your HP StorageWorks Tape Array 5300 *Getting Started Guide* for details of how to install SCSI cables and terminators to the SCSI connections on the rear panel of the tape array. The latest version of this document can be downloaded from [//www.hp.com/support/tapearray](http://www.hp.com/support/tapearray).

You will need to order the correct length and SCSI connector type cables and terminators to suit your particular configuration. Cable and terminator options are listed at the HP tape array support web site: [//www.hp.com/support/tapearray](http://www.hp.com/support/tapearray), and can be ordered from your local HP sales office.

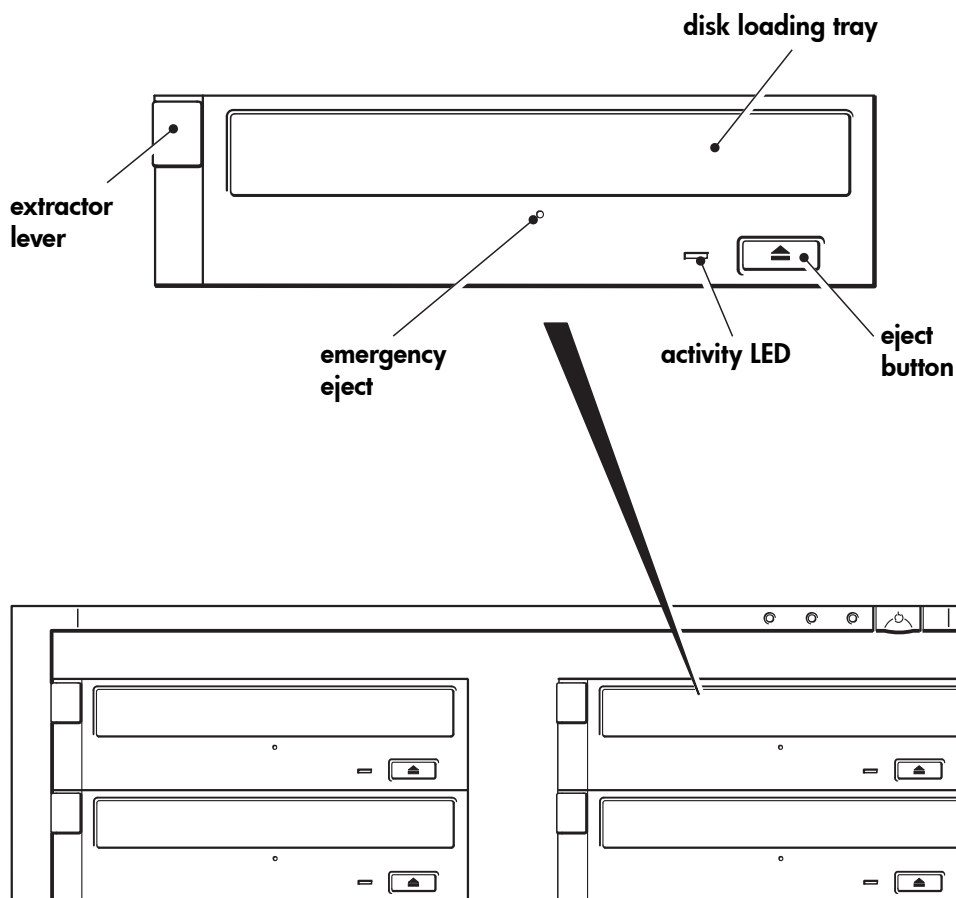


Figure 3: DVD+RW drive controls and indicators

Your HP StorageWorks DVD+RW drive

There is one LED, an eject button and an emergency eject slot on the front panel of your DVD+RW drive. See page 13 for more information about loading and unloading disks and page 17 for information about forcing ejection.

Front panel LEDs

There is one LED as illustrated in the diagram. (See figure 3.)

Activity

| LED state | Meaning |
|----------------|--|
| SOLID green | The drive is: <ul style="list-style-type: none">• loading the disk• performing a read or verify action• performing drive diagnostics |
| Flashing green | The drive is: <ul style="list-style-type: none">• writing to a CD or DVD disk• test writing a CD disk |
| OFF | The disk is: <ul style="list-style-type: none">• not inserted• loaded and ready• inserted and the drive is in power save mode |

Buttons

Eject button

Push this button to unload a disk from the disk loading slot. This button does not work if the power to the tape array is off or if a software application has disabled ejecting a disk.

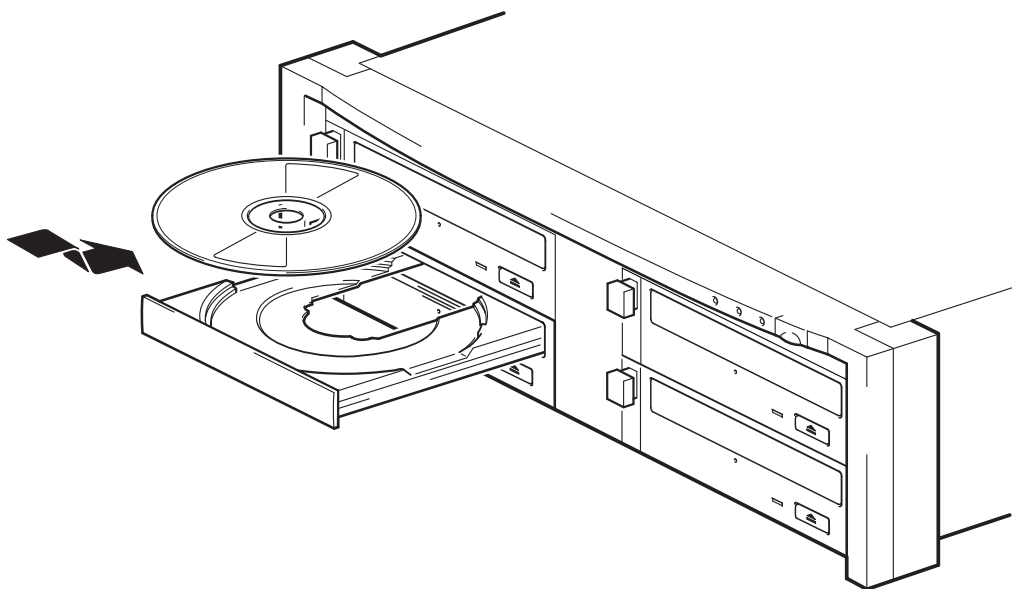


Figure 4a: loading a disk

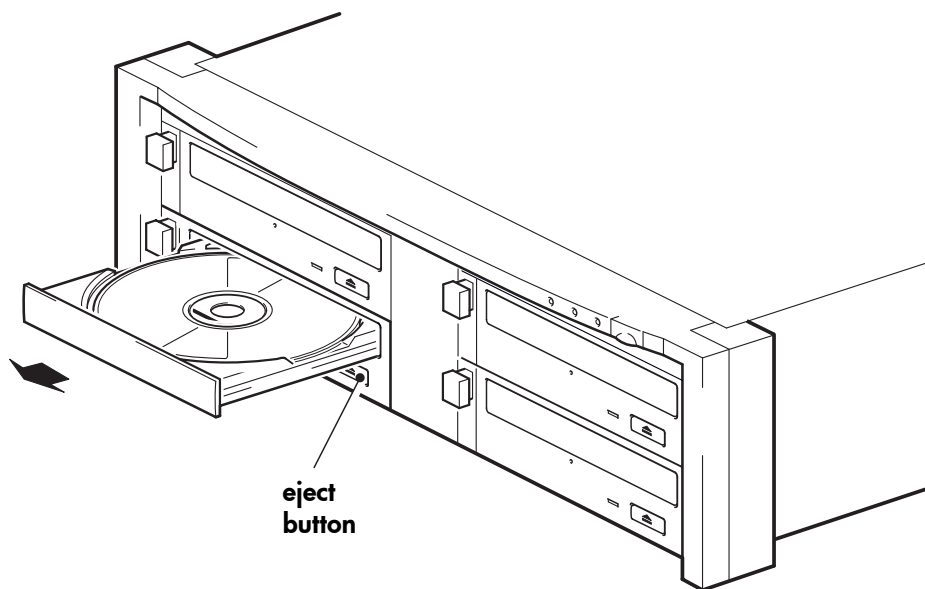


Figure 4b: unloading a disk

Operating the drive

To load a CD or DVD

- 1 Insert a CD or DVD into the disk loading tray with the printed side facing up, as shown in figure 4a, and push the tray gently back into the drive.
- 2 The Activity LED lights while the drive reads the CD or DVD to initialize. When the LED turns off, the CD or DVD is ready for use.

To unload a CD or DVD

- 1 Wait for the DVD+RW drive activity to stop. When the LED turns off, the CD or DVD is ready for unload.
- 2 Press the eject button, as shown in figure 4b. The disk loading tray will slide out. (This may take a few seconds).
- 3 Place the CD or DVD in its box or sleeve. Store it in a safe place.

Note Some application software can be configured to prevent unloading a CD or DVD until you exit the program. If the CD or DVD will not eject, check your software.

Emergency ejection of a CD or DVD disk

If a CD or DVD disk does not eject after pressing the eject button, use the emergency eject procedure described on page 17. UNIX operating systems will require the CD/DVD filesystem to be unmounted before the disk can be ejected.

Looking after disks

To preserve the disk

- Always store the CD or DVD disk in its protective case or sleeve.
- Always store the CD or DVD disk at temperatures between +10° to +60° C (+14° F to +140° F).
- Always allow the CD or DVD to stabilize after moving it from one temperature extreme to another before using.
- Always wipe a dirty CD or DVD with a clean, soft cloth. Wipe in a straight line, starting from the inside edge to the outside edge in a noncircular motion.
- Always replace damaged CDs or DVDs.

To avoid damage

- Never touch the surface of the CD or DVD with your fingers.
- Never scratch the reflective top or bottom surface of the CD or DVD.
- Never drop the CD or DVD.
- Never expose the CD or DVD to dirt, moisture or high humidity.
- Never use cleaning solutions to clean the CD or DVD.

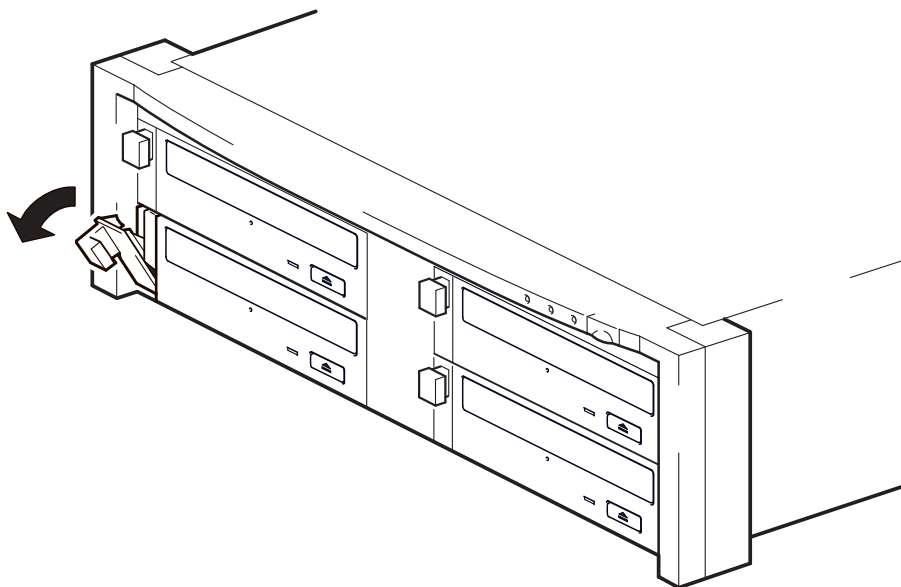


Figure 5a: pulling out the extraction lever

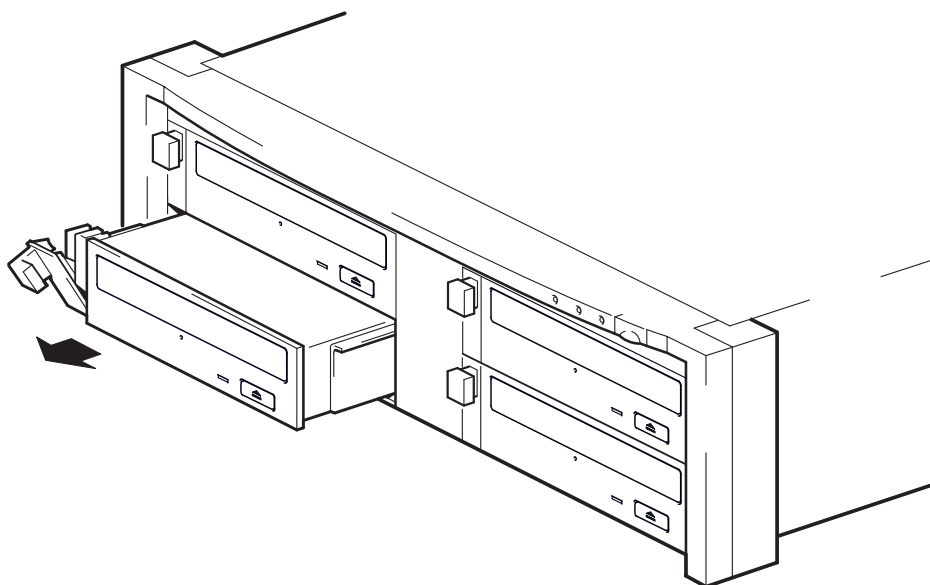


Figure 5b: removing the drive

Replacing the drive

HP StorageWorks DVD+RW drives can be removed and replaced without powering down the tape array. However you should be aware of the following:

- If all drives in the tape array are powered up when the system is turned on, the host will be aware of those drives. You can remove any of those drives and replace it with another drive as long as there is no activity on the bus.
- Do not remove or add drives to a bus that already has drives connected and running, for example backing up or restoring data. Wait until there is no activity on the bus before removing or adding drives.
- If a drive is not powered up or you place a drive in an empty slot *after* the system has been powered up, most systems will have to be reset before the host will recognize the drive.
- The SCSI IDs are controlled by the tape array, not by the drives themselves, so if you remove a drive and replace it with another the ID will not change.

- 1 Pull the extraction lever of the drive that you want to replace so that it is in the out position. (See figure 5a.)
- 2 Using the extraction lever, pull the drive gently and firmly out of the tape array. (See figure 5b.)
- 3 To insert another drive, follow the instructions in "Step 1: Install the drive" on page 7.

Troubleshooting

DVD+RW drive not performing correctly

If the DVD+RW drive is not performing correctly, confirm the following:

- Power switch on the HP StorageWorks Tape Array 5300 is ON
- Power LED on the HP StorageWorks Tape Array 5300 is ON
- DVD or CD disk does not have smudges, scratches, abrasion or other damage
- SCSI cables on the rear of the tape array are connected properly
- SCSI ID is recognized by the system (the SCSI ID is unique)
- SCSI bus is correctly terminated
- Host and the drive have the same SCSI interface type (LVDS)
- If a CD or DVD problem occurs, check the DVD+RW drive's Activity LED

Interpreting the activity LED

| Activity LED | Probable Cause | Action |
|--------------|--|--|
| FLASHING | Normal write activity for a CD or DVD disk | None |
| | Test writing a CD disk | None |
| | Tray locked and eject button pushed during write/read | None, wait for the activity to finish |
| | Flashing firmware | None |
| SOLID | Normal load or read activity for CD or DVDs | None |
| | Performing drive diagnostics | None |
| | Failed firmware flash operations | Call the HP service provider. |
| OFF | Normal state, with CD or DVD in drive, but no CD or DVD activity | None |
| | Normal state, with no CD or DVD in drive or drive in power save mode | None |
| | No power to the tape array | Check the power to the tape array. If the tape array has power, the DVD+RW drive may be defective. Call the HP service provider. |
| | SCSI cable not connected to the tape array or wrong SCSI cable | Check the SCSI cable and terminator on the back of the tape array. Call the HP service provider to check the drive's SCSI cable. |
| | Indeterminate drive malfunction | Call the HP service provider. |

If a problem persists after checking the above conditions, contact an HP service representative.

Warning

There are no user-serviceable parts inside the drive. When disassembled, the DVD+RW drive becomes a Class 1 laser mechanism. Blindness can result from exposure to the visible red laser beam and hazardous invisible laser radiation.

Service must be performed by trained support personnel. Attempting to disassemble the drive will void the warranty and may damage the drive.

Emergency ejection of a CD or DVD disk

If a CD or DVD disk does not eject after pressing the eject button, follow this procedure to manually eject.

Caution The emergency eject procedure must be done with the drive disconnected from the power supply. Failure to disconnect the drive from the power supply may pose a hazard to the media and the drive.

UNIX operating systems will require the CD/DVD filesystem to be unmounted before the disk can be ejected.

- 1 Remove the drive as described on page 15. This removes power from the DVD+RW drive. Alternatively, make sure that the tape array is not operating on any other device in the array, and then power down the tape array, as described in the HP StorageWorks Tape Array 5300 *Getting Started Guide*.
- 2 Locate the small emergency eject hole below the disk loading tray. See figure 3 on page 10.
- 3 Use a straight, metal pin of appropriate diameter, such as a 1/16" (1.59 mm) hex key (Allen wrench) and insert it in the emergency eject hole.
- 4 Push the pin **firmly with one continuous motion** into the hole until the disk is ejected. (Some mechanical sound and resistance is normal.)

Note If the tray does not fully extend, carry out step 5 so that the disk is reloaded and then repeat steps 1 to 5.

- 5 Replace the drive, as described on page 7.
If you powered down the tape array at step 1 above, power it on again now, as described in the HP StorageWorks Tape Array 5300 *Getting Started Guide*.

Preparing for a service call

If you need help, your dealer has the latest information regarding HP products and services and can provide support under HP's comprehensive menu of reseller services. If your dealer is not able to help, you can obtain support from HP directly.

Before calling for service or support:

- Check that your HP StorageWorks DVD+RW drive is installed correctly
- Check the instructions and the troubleshooting advice in this Getting Started Guide
- Run HP Library & Tapetools, which is a standalone diagnostics tool that provides a number of utilities for getting information about your tape drive and troubleshooting problems. It also gives advice to help you install your product and maintain optimum performance throughout the product's life. HP Library & Tape Tools is available from: www.hp.com/support/tapetools

When calling HP Customer Support, please be prepared to work with the HP support specialists to resolve your problem.

Obtaining service

A full listing of HP's service and support centers worldwide can be found at <http://www.hp.com/>.

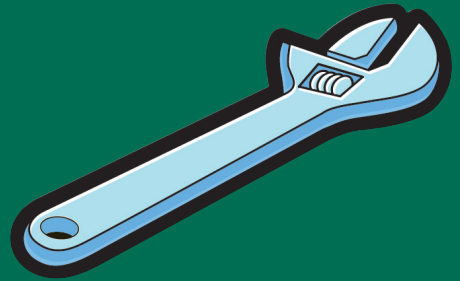
During the warranty period

HP provides a free telephone support service during the warranty period. Contact your local HP dealer or the appropriate HP technical support contact for your area. You will be connected to a responsive team waiting to help you.

After the warranty period

If you require support after your warranty has expired, you can receive support for a fee through the same telephone numbers. The fee is charged on a per incident basis. Alternatively, you can contact your local HP dealer who will be able to advise you and arrange for service.

The first part of the paper discusses the importance of understanding the underlying mechanisms of the observed phenomena. It is crucial to identify the key factors that influence the outcome, as this will help in developing effective interventions. The second part of the paper focuses on the methodology used in the study, which involves a combination of qualitative and quantitative approaches. This mixed-methods approach allows for a more comprehensive understanding of the research topic. The third part of the paper presents the results of the study, which show that the proposed intervention has a significant positive impact on the target population. Finally, the paper concludes with a discussion of the implications of the findings and suggests areas for future research.



<http://www.hp.com/support/tapearray>



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